

Assumptions for Furnace Homework Assignment

Category	Value	Data Source
Power		
ENERGY STAR Qualified Unit		
Initial Cost Per Unit	\$2,500	EPA 2000
Annual Fuel Utilization Efficiency (AFUE)	90	LBNL 2004
Heating Capacity of Boiler (Btu/h)	75,000 Btu/hr	EPA 2000
Btu per Therm of Gas	100,000 Btu/Therm	LBNL 2004
Use with programmable Thermostat (Yes/No)	Yes	
Lifetime (Gas)	18 years	LBNL 2004
Conventional Unit		
Initial Cost Per Unit	\$2,000	EPA 2000
Annual Fuel Utilization Efficiency (AFUE)	78	LBNL 2004
Heating Capacity of Boiler (Btu/h)	75,000 Btu/hr	EPA 2000
Btus per Gallon of #2 oil	140,000 Btu/gal	LBNL 2004
Btu per Therm of Gas	100,000 Btu/Therm	LBNL 2004
Use with programmable Thermostat (Yes/No)	No	
Lifetime (Gas)	18 years	LBNL 2004
Maintenance		
Labor cost (per hour)	\$20	EPA 2004
Labor time (hours)	0	EPA 2004
Usage		
Full-Load Heating Hours		
AK-Juneau	3,414	EPA 2002
AZ-Phoenix	1,116	EPA 2002
CA-San Francisco	2,948	EPA 2002
Discount Rate		
Commercial and Residential Discount Rate (real)	4%	A real discount rate of 4 percent is assumed, which is roughly
Energy and Water Prices		
2004 Residential Price of Gas	\$0.681 \$/Therm	LBNL 2004
Carbon Dioxide Emissions Factors		
Oil Carbon Emission Factors	159.3 lbs CO ₂ /MMBtu	LBNL 2004
Gas Carbon Emission Factors	116.16 lbs CO ₂ /MMBtu	LBNL 2004
CO₂ Equivalents		
Annual CO ₂ sequestration per forested acre	7,333 lbs CO ₂ /year	EPA 2003
Annual CO ₂ emissions for "average" passenger car	11,560 lbs CO ₂ /year	EPA 2003

<http://www.energystar.gov/>

http://www.energystar.gov/index.cfm?c=furnaces.pr_furnaces